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The 2013 European GreenLight Programme Evaluation

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Abstract

GreeeLight is a voluntary programme where private and public organisations commit towards the European Commission to upgrading their existing lighting and to designing new installations, using energy efficient lighting systems when the energy savings justify the investment and lightning quality is maintained or improved. This report assesses the achievements of the scheme in the year 2013. For 2013, 36 new Partners joined the programme.

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2. Executive Summary

The GreenLight Programme is a voluntary programme launched by the European Commission in the year of 2000 to increase non-residential lighting energy efficiency. By the end of 2013, 767 Partners from across the European Union, plus Norway and Switzerland, participated in GreenLight. This report assesses the achievements of the scheme in the year 2013. For 2013, 36 new Partners joined the programme.

The scope of the current analysis is to provide an insight into how the programme developed during the assessed period, both in terms of type and scope of new registrations, energy, cost savings and technologies involved. The comparison is based on the previous evaluation reports – the 2000-2008 Report, which represents an assessment of the programme over the period of eight years, the 2009 Report, the 2010 Report, the 2011 Report and the 2012 Report, which provided an yearly update. Regular spread sheet analysis was used for the evaluation. The main basis for the analysis are projects, which were registered by the 36 Partners.

As has been already mentioned in the previous evaluation, a limitation on this analysis derives from the fact that for some of the projects inadequate data is available. Out of the 36 projects that joined 2013 GreenLight Programme in 5 reports the data sent can be considered insufficient concerning the absolute energy savings. In addition, there were inconsistencies and gaps in the data reported concerning the payback time. A complete overview of the data provided by the Partners can be found in Table 6.5.

In 2006 a special emphasis was started to enlarge the GreenLight programme to the new Member States of the European Union. As a result the network of Partners further expanded. In the year 2013, 4 Partners from the New Member States were registered. Partners within 2013 came from 7 countries of the European Union. The country with the most Partners is Belgium with 15.

The 2000-2008 Report showed a total annual saving of all Partners of 241 GWh/a, for the reported period of eight years. In 2009, an additional saving amounted to about 16 GWh/year and Partners joined until the end of 2010 saved an amount of very respectable 40.7 GWh/a. In 2011, the reported annual savings amount to 10.6 GWh/a. In 2012 the amount of savings reached 7.9 GWh/a. In 2013, the reported annual savings are 4.3 GWh/a.

In the year 2013 there are 2 applications to outdoor projects. About 42 % of the projects were implemented in the category “Production Sites”. More than a half (58%) of the total of savings was achieved in projects in the same category.

Savings were achieved primarily through gradually upgrading technologies. The majority of projects exchanged fluorescent with more efficient fluorescent light bulbs. In the same time in 2013 implementation of LED - technology of light-emitting diodes increased (more than 1/3 of projects) compared to the year of 2012. More than 36% of the absolute energy savings are achieved implementing LED. In the year 2013 the development in terms of savings are very good. Majority of the projects reached a saving above 60 %.

In total, all 767 GreenLight Partners reach the savings of more than 320 GWh of electricity saved annually through efficient lighting by the end of 2013.

3. Introduction

In the year 2000, the European Commission launched the European GreenLight Programme to convince end-users to adopt energy efficient lighting technologies and systems, as well as to foster a gradual market conversion. GreenLight is promoting energy efficient lighting in non-residential premises and it is based on a voluntary participation. This Programme is managed by the Joint Research Centre of the European Commission.

Any European organisation - public or private, can join the programme as a GreenLight Partner. In the case in which energy savings can justify the relative investments, and that the lighting quality can be maintained or improved, Partner organisations commit themselves to upgrade their lighting systems in their existing facilities, and/or to install the best available energy efficient technologies in their new buildings, or outdoors. Joining the programme allows Partners to benefit from a wide public recognition for their efforts to improve the energy efficiency of their lighting systems in their organisation. Other organisation active in the lighting field could join GreenLight as Endorsers. Endorser organisations are promoting the GreenLight Programme to potential new Partners which might be, either in their country of origin, or in any other country in the EU. Their role is to expand the network of Partners as well as to provide assistance to Partners in their application process. Most importantly, it is to promote the proper implementation of energy saving measures.

The principles for participating in the GreenLight Programme are detailed in the respective guidelines for Partners and Endorsers. Partners have to report to the Joint Research Centre on their savings whenever they implement saving measures. Endorsers have to submit a Promotion Plan as part of their application, detailing the specific actions that they intend to take to promote the programme to potential Partners. Endorsers are expected to submit a Promotion Plan each year.

Besides the Joint Research Centre, National Contact Points have been created in most of the member states, covering a transitional role in the Green Light Programme: they constitute the bridge between the Joint Research Centre and interested local organisations. The National Contact Points provide information and guide potential Partners and Endorsers through the application process. The active National Contact Points submit applications to the Joint Research Centre on a regular basis.

Up until now, the achievements and particularities of the technologies adapted within the GreenLight Programme have been evaluated in several reports – the 2000-2008 Evaluation Report as well as the 2009, 2010, 2011 and 2012 Evaluation Reports. In addition, motivations of the Partners have been assessed within a Survey Report based on questionnaires, which has been published for the years 2008 to 2010. Case Studies and Catalogues representing all GreenLight Partners are available regularly.

The current Report is primarily focused on:

- The split of Partners by sector of activity
- The Partner's savings achieved (energy saved, costs saved, etc)
- The correlation between the investments and the savings
- The type of technologies applied.

4. Methods

This report is based on the information and documentation provided by the Partners that have applied to the GreenLight Programme and have reported on the results achieved through their own GreenLight project.

The period assessed is the calendar year 2013 and included all information reported by Partners newly registered within this period.

The assessment was carried out through the collection of information submitted by the Partners and its subsequent analysis through spread sheets, tables and graphs. Energy savings are calculated in the database by subtracting the consumption in kWh/a after the project from the consumption before the project. Costs savings in Euro are calculated in the database comparing the running cost (Euro/Year) before and after the programme implementation. The spread sheet also includes other data, if available, such as the project's investment payback time, the area interested by the intervention (size in square meters and whether indoors or outdoors) and the type of lamps and luminaries installed. The analysis is also split into different categories. These categories are based on the business sector of the Partners and also on the type of project implemented.

Based on the analysis of the previous years, the following categories were identified:

| | |
|-----|-------------------------------|
| A: | Airports |
| C: | City and Public Buildings |
| CP: | Car Parks |
| E: | Educational Buildings |
| HP: | Hospitals and Medical Centres |
| HR: | Hotel and Restaurants |
| LT: | Logistic and Transportation |
| O: | Others |
| OS: | Street Lighting |
| P: | Production Sites |
| PT: | Public Transportation |
| R: | Retail and Supermarkets |
| S: | Services and Offices |
| SP: | Sport Halls |
| T: | Telecommunications |
| U: | Unclear |

In the year of 2013, there were Projects within nine categories: Educational Buildings, Hotel and Restaurants, Logistics and Transportation, Production Sites, Retail and Supermarkets, Services and Offices, Street Lighting, Sport Halls and Others. 34 projects were implemented indoors and 2 are outdoor projects.

6. Results

6.1 Evolution of the GreenLight Programme in 2013

By the end of 2013, 36 new Partners joined GreenLight bringing the total number of Partners to 767. The new entry for 2013 constitutes a smaller number of new partners compared to the previous year. An increasing trend of Partner could only be achieved with additional promotional activities and additional budgets to reach new target groups. Figure 6.1 and table 6.1 show the number of new partners that joined the GreenLight Programme each year from 2000 to 2013 as well as the number of already existing Partners.

Figure 6.1 GreenLight 2000 to 2013: Development of New Registrations

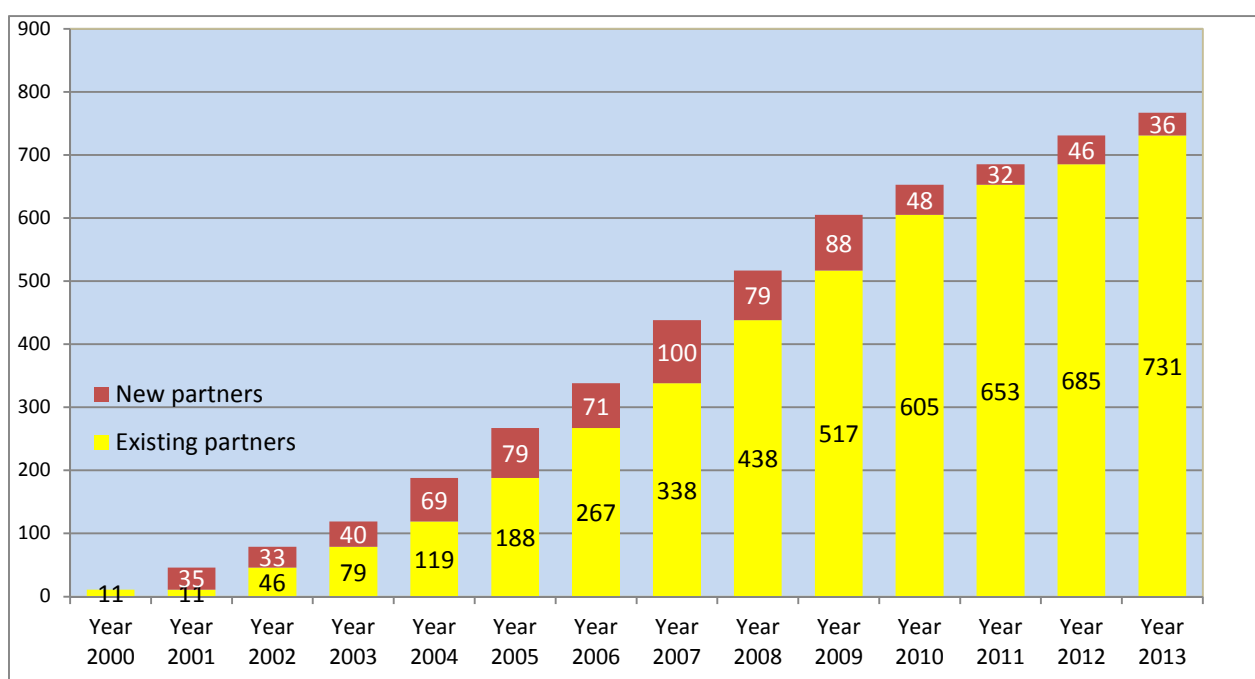


Table 6.1 GreenLight 2000 to 2012: Number of Partners Joining

| Year | Existing | New |
|--------------|------------|-----|
| 2000 | 0 | 11 |
| 2001 | 11 | 35 |
| 2002 | 46 | 33 |
| 2003 | 79 | 40 |
| 2004 | 119 | 69 |
| 2005 | 188 | 79 |
| 2006 | 267 | 71 |
| 2007 | 338 | 100 |
| 2008 | 438 | 79 |
| 2009 | 517 | 88 |
| 2010 | 605 | 48 |
| 2011 | 653 | 32 |
| 2012 | 685 | 46 |
| 2013 | 731 | 36 |
| Total | 767 | |

6.2 Composition of Partners

The size of the Partners varies to a large degree. Some companies are large international groups with thousands of indoor square meters, whilst others are small companies. Implemented projects are in industrial halls, offices, stores, shops, street lighting, public buildings, restaurants, sport hall, covering from 100 to 50000 square meter.

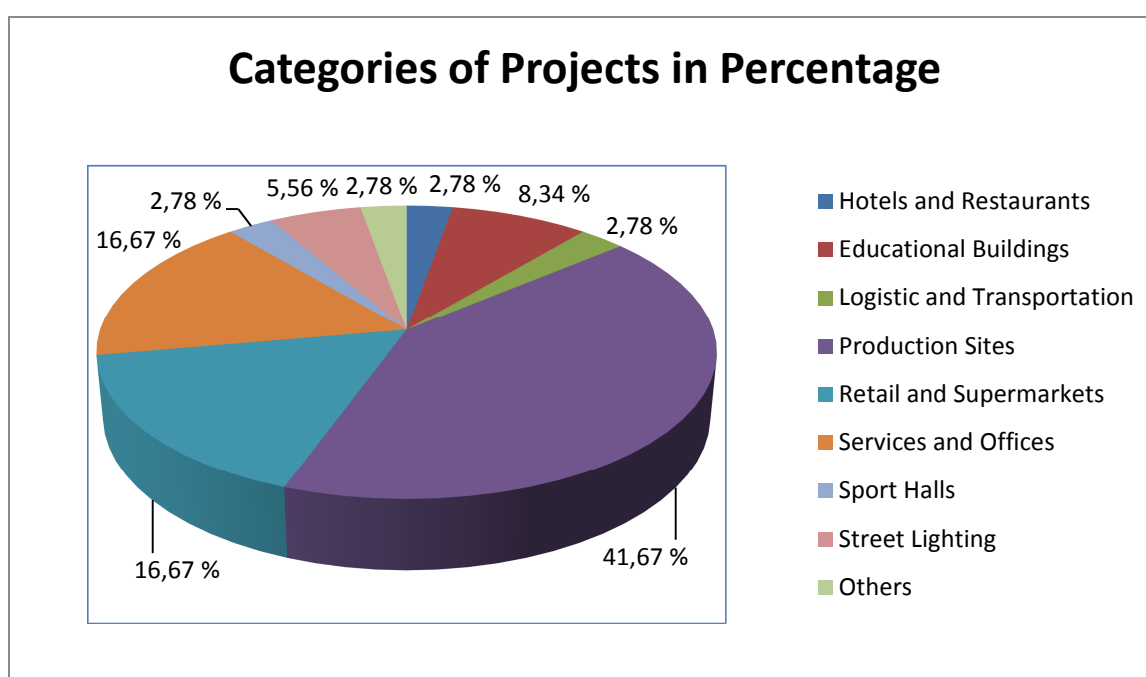
There were nine categories covered in 2013: Educational Buildings, Hotel and Restaurants, Logistics and Transportation, Production Sites, Retail and Supermarkets, Services and Offices, Street Lighting, Sport Halls and Others.

The 36 Partners from 2013 came from 7 countries of the European Union. There were 4 projects submitted for the so called New Member States.

| Table 6.2 GreenLight 2012: Number of Projects by Country | |
|--|----------------|
| Country | N° of projects |
| Belgium | 15 |
| France | 10 |
| Germany | 5 |
| Croatia | 2 |
| Romania | 2 |
| Slovakia | 1 |
| Spain | 1 |
| total | 36 |

Figure 6.2 shows the share of the different categories of the GreenLight Programme projects implemented in 2013.

Figure 6.2 GreenLight 2013: Categories of Projects in Percentage



In 2013 the largest fraction of projects by far came from the category “Production Sites”. This is a considerable change from last year, where the largest fraction was projects in the category “Hotels and Restaurants”. Neither the largest category of 2010 – which was “Street Lighting” – nor the classical indoor public activity field “Public Buildings”, which was the largest category in the assessment of the scheme 2000-2008 according to number had much weight in 2013.

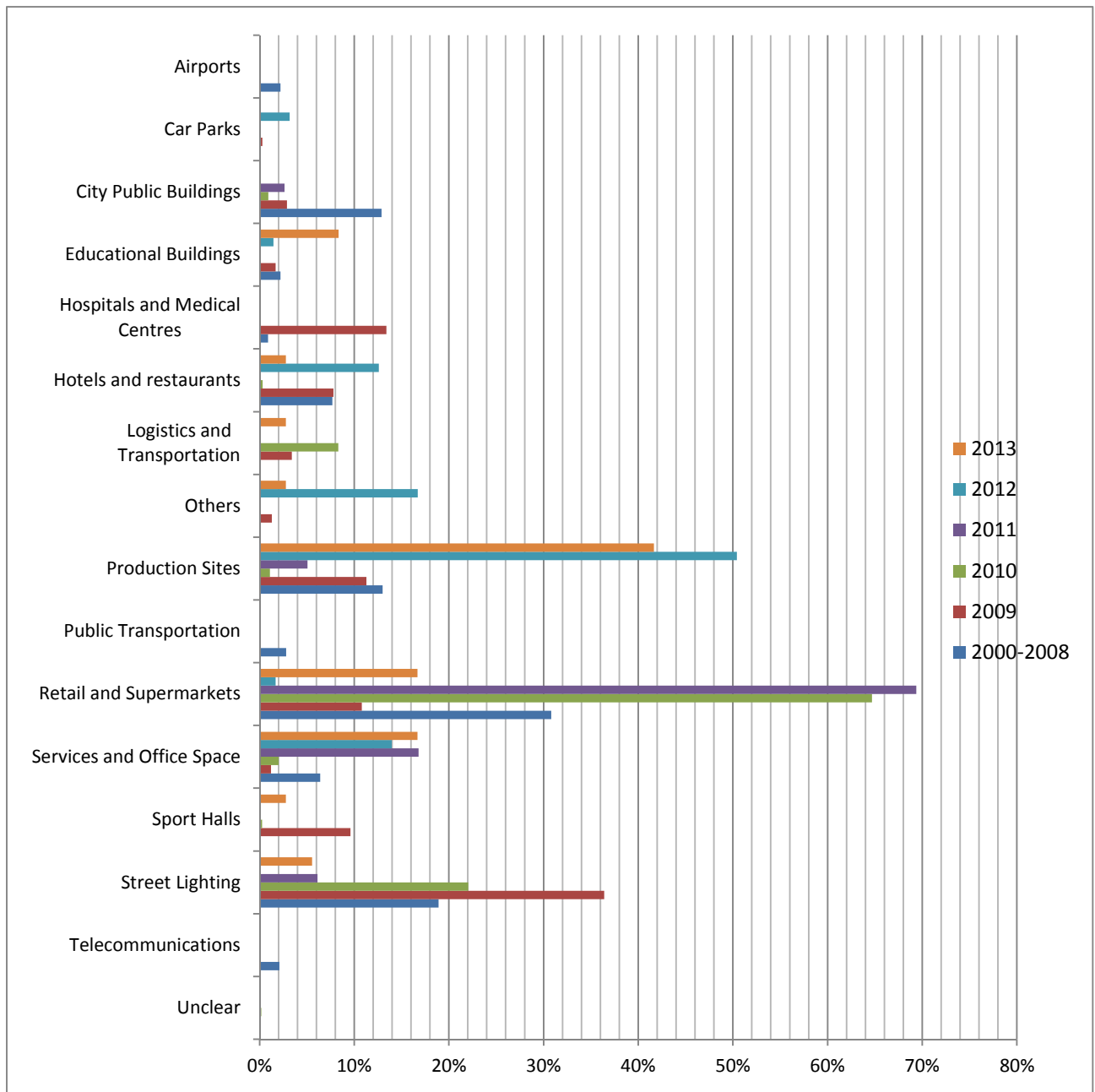
Table 6.3 GreenLight 2013: Number of Projects by Category

| Category | N° of projects |
|------------------------------|----------------|
| Hotels and Restaurants | 1 |
| Production Sites | 15 |
| Service and Office Space | 6 |
| Educational Buildings | 3 |
| Retail and Supermarkets | 6 |
| Logistics and Transportation | 1 |
| Sport Halls | 1 |
| Street Lighting | 2 |
| Others | 1 |
| total | 36 |

Table 6.4 GreenLight 2000 to 2013: Savings by Category in Percentage of Total According to Reports

| * category with highest percentage within Report | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|
| Category | 2000-2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| Airports | 2,2% | - | - | - | - | - |
| Car Parks | 0,1% | 0,3% | - | - | 3,17% | - |
| City Public Buildings | 12,9% | 2,9% | 0,92% | 2,64% | - | - |
| Educational Buildings | 2,2% | 1,7% | 0,10% | - | 1,46% | 8,34% |
| Hospitals and Medical Centres | 0,9% | 13,4% | - | - | - | - |
| Hotels and Restaurants | 7,7% | 7,8% | 0,34% | - | 12,60% | 2,78% |
| Logistics and Transportation | - | 3,4% | 8,33% | - | - | 2,78% |
| Others | - | 1,3% | - | - | 16,70% | 2,78% |
| Production Sites | 13,0% | 11,3% | 1,11% | 5,06% | 50,41% | 41,67% |
| Public Transportation | 2,8% | - | 0,00% | - | - | - |
| Retail and Supermarkets | 30,80% | 10,8% | 64,70% | 69,36% | 1,70% | 16,67% |
| Services and Office Space | 6,4% | 1,2% | 2,01% | 16,81% | 13,96% | 16,67% |
| Sports Halls | - | 9,6% | 0,27% | - | - | 2,78% |
| Street Lighting | 18,9% | 36,40% | 22,05% | 6,13% | - | 5,56% |
| Telecommunications | 2,1% | - | - | - | - | - |
| Unclear | - | - | 0,18% | - | - | - |
| total | 100 % | 100 % | 100 % | 100 % | 100% | 100 % |

Figure 6.3 GreenLight 2000 to 2013: Savings by Category in Percentage According to Reports



6.3. Quality of Reporting

The total number of projects registered in 2013 is 36. In general, the quality of reporting is satisfactory. Only very little information was not provided as to the investments, payback time period or the type of ballast and luminaries adopted. The results have been submitted in many different ways, both through the application form supplied by the GreenLight Programme as well as in the form of a free submission of information on the projects. The non-homogeneous submission of data has been an obstacle for the proper comparison and evaluation of both the technical and economic information. Common and mandatory reporting should be encouraged and enforced. In Table 6.6 all percentage data reported per project can be seen.

| Table 6.5 GreenLight 2013: Type of Data submitted by the Partners | | |
|--|--|----------------------------|
| Numbers of partners in the research | | 36 |
| Numbers of projects in the research | | 36 |
| Type of data | No of projects, who submitted this data | In percent of total |
| Country | 36 | 100,00% |
| Sector | 36 | 100,00% |
| Indoor/Outdoor | 36 | 100,00% |
| Lamp changes | 35 | 97,22% |
| Effective Energy Savings in % | 35 | 97,22% |
| Lamps after 1 | 35 | 97,22% |
| Lamps before 1 | 31 | 88,57% |
| Effective Energy Savings kWh/a | 31 | 88,57% |
| Consumption before kWh/a | 30 | 85,71% |
| Consumption after kWh/a | 35 | 97,22% |
| Project Name | 31 | 88,57% |
| Payback in years | 22 | 61,11% |
| Investment costs € | 20 | 55,56% |
| Upgraded surface in m2 | 31 | 88,57% |
| Running cost in €/a before | 25 | 69,44% |
| Running cost in €/a after | 26 | 72,22% |
| Savings in running costs €/a | 26 | 72,22% |
| Luminaire changes | 27 | 75,00% |
| Ballast type changes | 23 | 63,89% |
| Ballast before | 23 | 63,89% |
| Ballast after | 23 | 63,89% |
| Reflector before | 20 | 55,56% |
| Reflector after | 20 | 55,56% |
| Lamps before 2 | 19 | 52,78% |
| Lamps after 2 | 21 | 58,33% |
| Lamps before 3 | 14 | 38,89% |
| Lamps after 3 | 14 | 38,89% |
| Lighting control upgrades | 7 | 19,44% |
| Description | 6 | 16,67% |

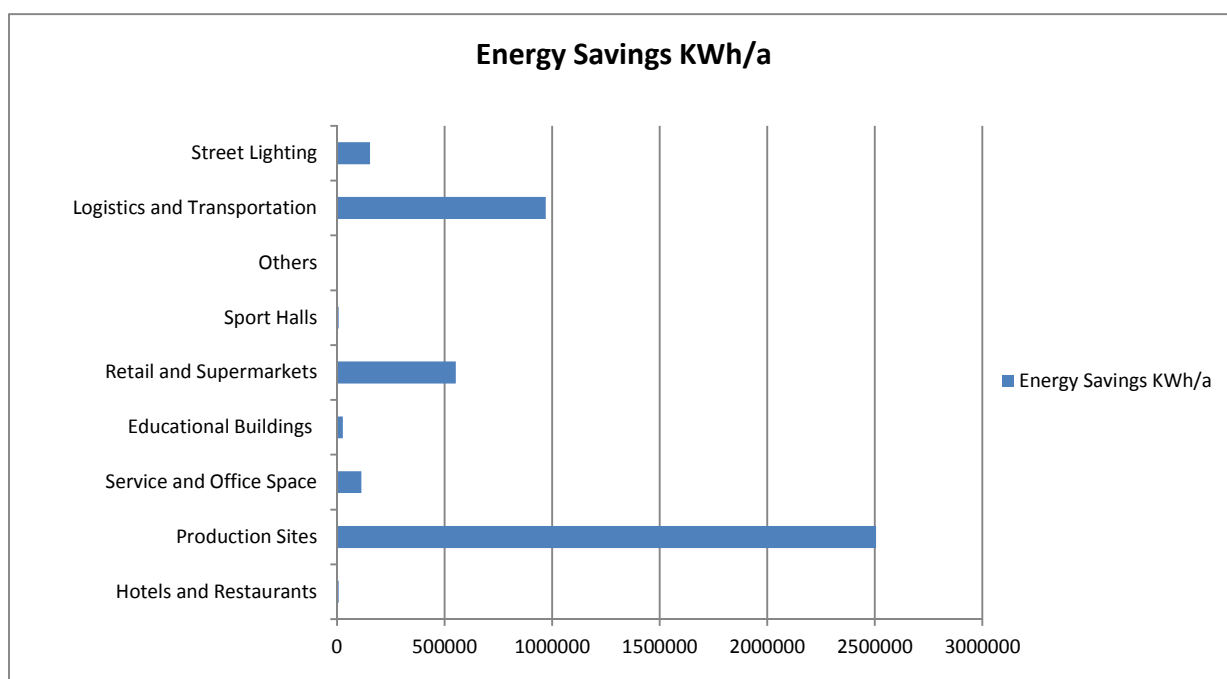
6.4 Energy Savings

In total, the 2013 GreenLight Partners achieved to save a 4.327.494 kWh/a or approximately 4,3 GWh per year.

| Year | Total number of partners | Total savings in kWh/a | Average saving in kWh/a per partner |
|--------------|--------------------------|------------------------|-------------------------------------|
| 2000 | 11 | 8.839.674,00 | 803.606,73 |
| 2001 | 35 | 46.312.204,00 | 1.323.205,83 |
| 2002 | 33 | 31.506.482,00 | 954.741,88 |
| 2003 | 40 | 50.364.496,03 | 1.259.112,40 |
| 2004 | 69 | 13.484.372,00 | 195.425,68 |
| 2005 | 79 | 3.142.521,59 | 39.778,75 |
| 2006 | 71 | 29.461.975,90 | 414.957,41 |
| 2007 | 100 | 36.892.976,91 | 368.929,77 |
| 2008 | 79 | 21.027.109,42 | 266.165,94 |
| 2009 | 88 | 15.323.958,82 | 174.135,90 |
| 2010 | 48 | 40.705.956,15 | 848.040,75 |
| 2011 | 32 | 10.591.957,36 | 330.998,67 |
| 2012 | 46 | 7.862.005,00 | 170.913,15 |
| 2013 | 36 | 4.327.494,00 | 120.208,17 |
| total | 767 | 319.843.183,18 | 417.005,45 |

The highest amount of energy with 41,67 % was saved in the single category of “Production Sites”.

Figure 6.4 GreenLight 2013: Total Energy Savings by Category

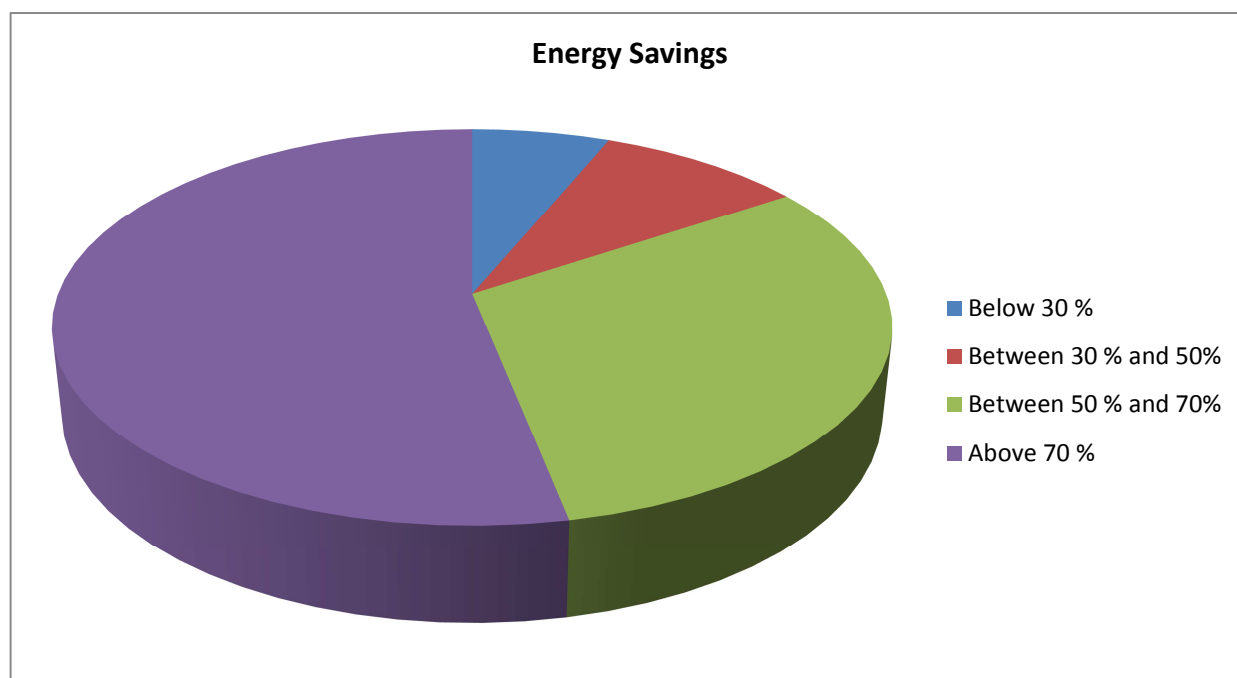


| Table 6.7 GreenLight 2013: Total and Average Savings by Category | | | |
|---|---------------------------|-------------------------------|---|
| Category | Number of projects | Total savings in KWh/a | Average savings per project in kWh/a |
| Hotels and Restaurants | 1 | 6.486 | 6.486,00 |
| Production Sites | 15 | 2.506.202 | 167.080,17 |
| Service and Office Space | 6 | 112.092 | 22.418,40 |
| Educational Buildings | 3 | 22.013 | 11.006,50 |
| Retail and Supermarkets | 6 | 551.134 | 137.783,50 |
| Logistics and Transportation | 1 | 969.593 | 249.500,00 |
| Sport Halls | 1 | 6.500 | 6.500,00 |
| Street Lighting | 2 | 154.474 | 76.737,00 |
| Others | 1 | N.A. | N.A. |
| total | 36 | 4.327.494 | 120.208,17 |

Note: the average has only been calculated for those partners, who stated savings, i.e. for the category "Service and Office Space", 1 project did not indicate a total of savings; therefore the average here was calculated for 5 projects, for the category "Educational Buildings", 1 project did not indicate a total of savings; therefore the average here was calculated for 2 projects, for the category "Retail and Supermarkets", 2 projects did not indicate a total of savings, therefore the average here was calculated for 4 projects, for the category "Others", 1 project did not indicate a total of savings therefore the average savings are not available.

As regards the percentage of effective energy savings reached, the data shows variation. However, it has to be noted that the majority of effective energy savings reached are above 70 % and thus represent a clear bigger achievement than in the previous report of 2012.

Figure 6.5 GreenLight 2013: Effective Energy Savings reached in %. Groups.



| Table 6.8 GreenLight 2013: Effective Energy Savings in % Groups by Projects | |
|---|----------------|
| Percentage range | No of projects |
| 20-25 % | 1 |
| 25-30 % | 2 |
| 30-35 % | - |
| 35-40 % | 2 |
| 40-45 % | 1 |
| 45-50 % | - |
| 50-55 % | 1 |
| 55-60 % | 3 |
| 60-65 % | 2 |
| 65-70 % | 3 |
| 70-75 % | 8 |
| 75-80 % | 4 |
| 80-85 % | 3 |
| 85-90 % | 1 |
| 90-95 % | 1 |
| N.A. | 4 |
| total | 36 |

The highest percentage in savings with 57,91% was reached in the category “Production Sites”, whereas the smallest percentage in savings with 0,15% was reached in the category of “Hotels and Restaurants”. Table 6.9 shows the groupings of the projects according to the percentage range of energy savings achieved. When divided into the different categories the category of “Production Sites” with a total of 15 projects, that have stated their percentage of savings, can be considered to be the category with the highest achieved savings.

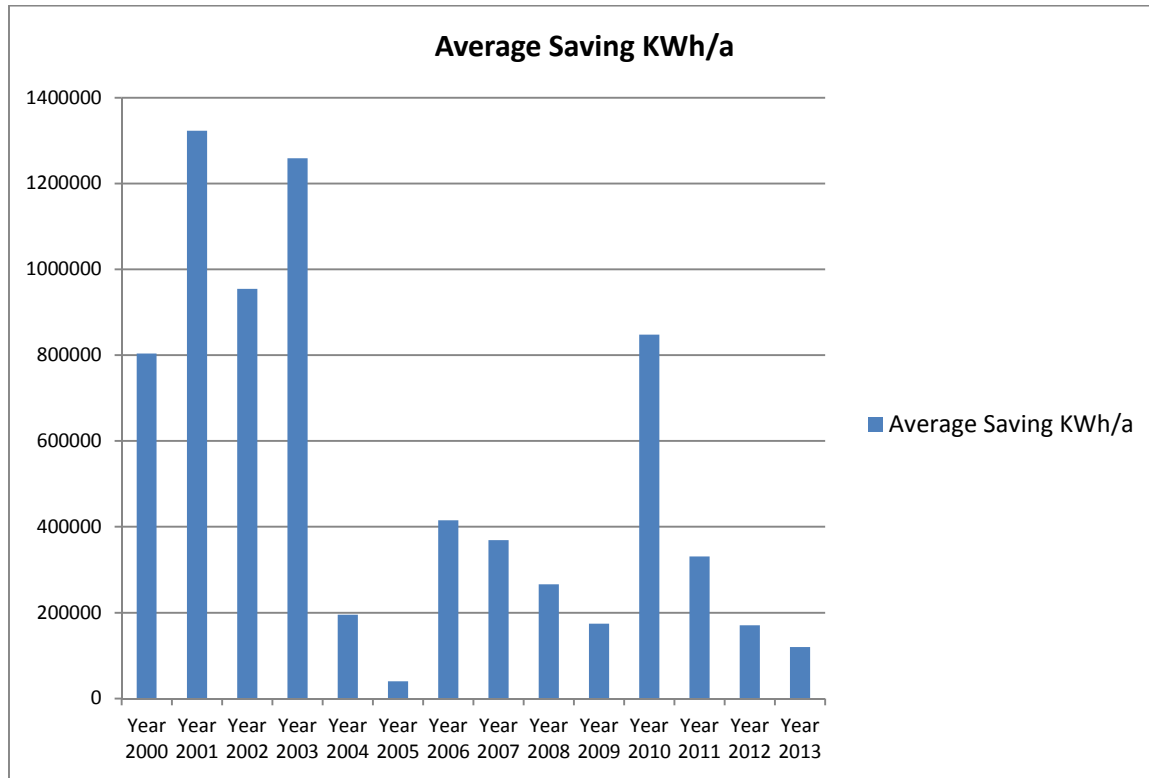
| Table 6.9 GreenLight 2013: Effective Energy Savings in % Groups by the Category | | | | | | | | | | | |
|---|------------|----|----|----|----|----|----|----|---|-------|--|
| Percentage range | Categories | | | | | | | | | | |
| | SL | EB | HR | PS | RS | SO | SH | LT | O | total | |
| 20-25 % | | | | 1 | | | | | | 1 | |
| 25-30 % | | 1 | | 1 | | | | | | 2 | |
| 30-35 % | | | | | | | | | | - | |
| 35-40 % | | 1 | | 1 | | | | | | 2 | |
| 40-45 % | | 1 | | | | | | | | 1 | |
| 45-50 % | | | | | | | | | | - | |
| 50-55 % | | | | 1 | | | | | | 1 | |
| 55-60 % | | | | 2 | 1 | | | | | 3 | |
| 60-65 % | | | | 1 | | 1 | | | | 2 | |
| 65-70 % | 1 | | | 1 | | | 1 | | | 3 | |
| 70-75 % | | | | 4 | 2 | 1 | | 1 | | 8 | |
| 75-80 % | | | | 2 | 1 | 1 | | | | 4 | |
| 80-85 % | 1 | | | 1 | | 1 | | | | 3 | |
| 85-90 % | | | 1 | | | | | | | 1 | |
| 90-95 % | | | | | | 1 | | | | 1 | |
| N.A. | | | | | 2 | 1 | | | 1 | 4 | |
| total | 2 | 3 | 1 | 15 | 6 | 6 | 1 | 1 | 1 | 36 | |

CL: Street Lighting; EB: Educational Buildings; HR: Hotels and Restaurants; PS: Production Sites; R: Retail and Supermarkets; SO: Services and Offices; SH: Sport Halls; LT: Logistic and Transportation; O:Others

The average percentage of savings reached in 2012 is 60,95% and it's significantly higher than average percentage of savings in 2011 which is 32,91%. For 2013 the average percentage of savings is 66,67%. It constitutes an increase of the average by 6 %.

The average savings per partner in KWh per year decrease compared to previous year and for the year of 2013 is 120.208,17 KWh/a.

Figure 6.6 GreenLight 2000 to 2013: Average saving in kWh/a per Partner and Year



| Year | Savings in kWh/a | N° of Partners | Average saving in kWh/a per Partner |
|--------------|-----------------------|----------------|-------------------------------------|
| 2000 | 8.839.674,00 | 9 | 803.606,73 |
| 2001 | 46.312.204,00 | 26 | 1.323.205,83 |
| 2002 | 31.506.482,00 | 26 | 954.741,88 |
| 2003 | 50.364.496,03 | 30 | 1.259.112,40 |
| 2004 | 13.484.372,00 | 51 | 195.425,68 |
| 2005 | 3.142.521,59 | 20 | 39.778,75 |
| 2006 | 29.461.975,90 | 42 | 414.957,41 |
| 2007 | 36.892.976,91 | 75 | 368.929,77 |
| 2008 | 21.027.109,42 | 70 | 266.165,94 |
| 2009 | 15.993.341,22 | 53 | 174.135,90 |
| 2010 | 40.705.956,15 | 48 | 848.040,75 |
| 2011 | 10.591.957,36 | 32 | 330.998,66 |
| 2012 | 7.862.005,00 | 46 | 170.913,15 |
| 2013 | 4.327.494,00 | 36 | 120.208,17 |
| total | 319.843.183,18 | 767 | 417.005,45 |

6.5 Cost of Savings and Investments

The data shows that within the category “Logistics and Transportation” the largest amount regarding the costs was saved on average per partner.

Table 6.11 GreenLight 2013: Total and Average Cost Savings by Category

| Category | N° of projects | N° of projects (data available) | Total savings in running cost in €/a | Average savings per partner in running cost in €/a |
|------------------------------|----------------|---------------------------------|--------------------------------------|--|
| Hotels and Restaurants | 1 | N.A. | N.A. | N.A. |
| Production Sites | 15 | 15 | 159.344 € | 10.622,93 € |
| Service and Office Space | 6 | 3 | 9.773 € | 3.257,67 € |
| Educational Buildings | 3 | 1 | 1.088 € | 1.088 € |
| Retails and Supermarkets | 6 | 3 | 35.478 € | 11.826 € |
| Street Lighting | 2 | 2 | 30.357 € | 15.178 € |
| Logistics and Transportation | 1 | 1 | 51.316 € | 51.316 € |
| Sport Halls | 1 | 1 | 1.691 € | 1.691 € |
| Others | 1 | N.A. | N.A. | N.A. |
| total | 36 | 26 | 289.047 € | 11.117,19 € |

The figure shows average savings per partner in running cost in €/a, and it has been estimated only for those partners/projects which have submitted data about it in the reporting forms.

Data on the payback period was only available for 61 % or 22 of the projects. The table below clearly shows that the most frequent payback time is between 1 and 2 years. The average is a payback period of 3,56 years. However it is very difficult to further elaborate on this figure due to the limited number of figures given. The smallest payback period given is 1 year and the highest was indicated with 13,3 years.

Table 6.12 GreenLight 2013: Payback Time in Years Grouped by Technology Implemented

| Payback Time | T5 | HP Mercury | LED | N° of projects |
|---------------------|-----------|------------|-----------|----------------|
| 1 – 2 Years | 7 | | 2 | 9 |
| 2 – 2,5 Years | 2 | | 1 | 3 |
| 2,5 – 3 Years | | | 1 | 1 |
| 3 – 3,5 Years | 2 | | | 2 |
| 3,5 – 4 Years | | | | |
| 4 – 4,5 Years | 1 | | | 1 |
| 4,5 – 5 Years | 1 | | | 1 |
| 5 – 5,5 Years | | | 1 | 1 |
| More than 5,5 Years | 2 | | 2 | 4 |
| N/A | 6 | 1 | 7 | 14 |
| total | 21 | 1 | 14 | 36 |

T5: 16mm fluorescent (T5)
 HP: HP Mercury
 LED: Light-emitting diode
 N/A: Data not available

Regarding the investments costs for relighting, the data given is not satisfactory. Only part of the projects indicated their investments varying from 2.732 to 216.278 €. Because of the small numbers available a statement on the correlation between investments made and achieved savings is not feasible.

Also based on this scarce data, it is also more than difficult to establish clear statements about the ratio of made investment to the savings achieved in kWh/a.

6.6 Technological Interventions

As regards the technological aspects of the projects, the data received was not very detailed, even if the percentage of project given information on lamp changes was much higher than in the report before. Within the given templates, Partners have the option to report three substitutions, but often reported only a single change.

Within this report, the highest lamp change implemented is from T8 (26 mm fluorescent) to T5 (16 mm fluorescent) in 21 projects. Changes from T5 (16 mm fluorescent) to LED (Light Emitting Diodes) have been made from 6 partners. Changes from fluorescent to fluorescent lamps with a higher efficiency have been made in 10 projects. There are 3 projects in which partners replaced the old halogen lamps with LED and 1 project where metal halide lamps have been replaced to LED. In 9 projects standard high pressure lamps have been replaced with T5.

| Table 6.13 GreenLight 2013: Lamp Changes | | | | | |
|--|---------------|---------------|-----------|----|-----------|
| | Lamps after 1 | | | | |
| Lamps before 1 | T5 | HP Mercury | LED | T8 | total |
| 16mm fluorescent (T5) | | | 6 | | 6 |
| 26mm fluorescent (T8) | 10 | | 1 | | 11 |
| Halogen | | | 3 | | 3 |
| Metal halide | | | 1 | | 1 |
| Standard high pressure mercury | 7 | 1 | | | 8 |
| Standard high pressure sodium | 1 | | 1 | | 2 |
| Unspecified fluorescent | 1 | | | | 1 |
| N/A | 2 | | 2 | | 4 |
| total | 21 | 1 | 14 | | 36 |

T5: 16mm fluorescent (T5)

T8: 26mm fluorescent (T8)

LED: Light-emitting diode

N/A: Data not available

The lighting technologies applied are a continuation of the trend outlined in the 2000-2008 Report and well as in the follow-up 2009 Report, which means that a transition from less efficient incandescent lamps (which was only mentioned in one single project in 2010 and not at all within 2011 and 2012) magnetically ballasted fluorescent lamps and/or mercury vapour lamps, to more efficient electronic fluorescent lamps and compact fluorescent lamps as well as very high efficient LED. However, with the majority of partners within the current report, the changes have been from fluorescent to fluorescent lamps with a higher efficiency.

For the changes in ballast and luminaries, the data submitted is not as good. The highest percentages of changes within the ballast reported are changes from conventional magnetic ballast to electronic non dimmable ballast. Concerning the luminaries the majority reported a change from a regular painted

reflector to an aluminised reflector. Changes in the regulation were only reported for several projects, but the basis for a further analysis is unsatisfactory.

Also a correlation between technology chosen after the intervention (Lamp after 1) and the effective energy savings reached in percent shows, that not surprisingly the changes from fluorescent to fluorescent lamp in general does not yield savings more than changes to LED.

| Table 6.14 GreenLight 2013: Lamp Changes in Correlation to Percentage Energy Saved | | | | | |
|---|-----------|-------------------|------------|-----------|--------------|
| Effective Energy Savings in % groupings | T5 | HP Mercury | LED | T8 | total |
| 20-25 % | 1 | | | | 1 |
| 25-30 % | 1 | | 1 | | 2 |
| 30-35 % | | | | | - |
| 35-40 % | 1 | | 1 | | 2 |
| 40-45 % | 1 | | | | 1 |
| 45-50 % | | | | | - |
| 50-55 % | 1 | | | | 1 |
| 55-60 % | 3 | | | | 3 |
| 60-65 % | 2 | | | | 2 |
| 65-70 % | 1 | 1 | 1 | | 3 |
| 70-75 % | 4 | | 4 | | 8 |
| 75-80 % | 2 | | 2 | | 4 |
| 80-85 % | 1 | | 2 | | 3 |
| 85-90 % | 1 | | | | 1 |
| 90-95 % | 1 | | | | 1 |
| N.A. | 1 | | 3 | | 4 |
| total | 21 | 1 | 14 | | 36 |

T8: 26mm fluorescent (T8)

T5: 16mm fluorescent (T5)

LED: Light-emitting diode

N/A: Data not available

8. Conclusions

The overall development of the GreenLight Programme in 2013 did not increase the amount of energy saved as a whole, but the percentage of energy savings increase compared to the reports in 2012 and 2011. The average of energy saved in 2012 is 60,95 %, within the year of 2013 it's 66,67%, whilst in 2011 it was 32,91%. The reason for this can be found in the composition of partners listed for 2012 and 2013 dominated by Production Facilities, part of them implemented new technologies such as LED, whilst partners listed within the year 2011, are dominated by supermarkets that implemented gradual energy efficiency improvements and not radical new technologies.

In 2013 implementation of LED - technology of light-emitting diodes increased - more than 1/3 of projects used this technology. More than 36% of the absolute energy savings are achieved implementing LED. In the year 2013 the development in terms of savings are very good.

The public recognition and positive image as well as the respectable results achieved in overall savings underline that the GreenLight Programme is worth to be continued with increased efforts.

9. Recommendations

In general, the GreenLight Programme constitutes a very positive voluntary commitment that activates and engages many various actors across Europe, but a new strategic redirection of the scheme could be useful. A modernization and strategic redirection of the scheme is closely related to potential available financial and manpower resources. An update of guidelines, assisting materials and enhancement of the website including electronic registration functions might be able to make application and registration easier. This could also include a modernised electronic reporting possibilities and functions via the website such as a proper log-in accessible databank, which would allow the JRC to better evaluate and access the success and results. This again would contribute to the diffusion and promotion of the scheme.

9. Appendices

I. List of Partners which joined the GreenLight Programme in 2013.

1. Banque de France
2. Privredna banka Zagreb d.d
3. Greenbridge Incubator NV
4. CLAL France
5. City of Jastrebarsko
6. Kaufman & Broad
7. Michalke Finanzdienste GmbH
8. Algeco Belgium NV
9. Comcon- SAS bvba
10. SML Service Magazijn Limburg NV
11. AR Metallizing
12. Punch Powertrain NV
13. Conved Plastics Genk NV
14. STAS
15. EOC Belgium NV
16. Roba Metal Processing
17. Spaas Kaarsen NV
18. Desso NV
19. HP Pelzer
20. Konings
21. Visko Teepak
22. Auchan Iasi Romania
23. Auchan Crangasi Romania
24. Airport Squash & Fitness
25. Ecole Sathonay Camp
26. Commune D'Aureilhan
27. CAPI
28. Stad Kortrijk
29. Pinturas Utrera S.L
30. OMS spol s.r.o. F warehouse
31. Les Nouveaux Espaces
32. L'Acqua
33. Au Jardine de Julie
34. Hammer GmbH & Co KG
35. B&K & Co KG
36. Max Moritz GmbH & Co KG

II. Winners of the Green Light Awards

2003

1. Statoil (Norway)
2. Apoteket AB (Sweden)
3. Comune di Trezzano Rosa (Italy)
4. Lorentz Casimir Lyceum (The Netherlands)
5. Monte dei Paschi di Siena (Italy)
6. Neukauff Merz (Germany)

2004

1. Athens International Airport (Greece)
2. Carrefour Italia (Italy)
3. City of Hamburg (Germany)
4. City of Helsinki Educational Department (Finland)
5. City of Zurich (Switzerland)
6. Dolce & Gabbana (Italy and Germany)
7. Futebol Clube do Porto (Portugal)
8. Gemeente Sittard-Geleen (Netherlands)
9. Groupe Casino (France)
10. Dn BNOR ASA v/Vital Eiendom AS (Norway)

2005

1. San Paolo IMI (Italy)
2. Provincia di Reggio Emilia (Italy)
3. TIM (Greece) – today WIND
4. Auchan (France)
5. Q8 (Denmark)
6. Centocor (The Netherlands) – today SenterNovem
7. Halliburton (Norway)
8. EDP (Portugal)
9. McDonald's (Europe)
10. Wipark (Austria)

2006

1. City of Oslo (Norway)
2. COOP (Italy)
3. Gates Europe nv (Belgium)
4. Hospital Universitario Virgen de las Nieves de Granada (Spain)
5. Nyborg Municipality (Denmark)
6. Philips (The Netherlands)
7. Piraneus Bank (Greece)
8. Servicio Extremeno de Salud (Spain)
9. SP-Tratek (Sweden)
10. Stadt Graz (Austria)
11. Stadt Frankfurt am Main Hochbauamt (Germany)
12. swb Netze Bremerhaven (Germany)
13. Vodafone Portugal (Portugal)
14. Zehnder Group Produktion Graenichen (Switzerland)

2008

1. Dumaplast NV (Belgium)
2. Stadsbestuur Sint-Niklaas (Belgium)
3. Municipality of Gorna Oryahovitsa (Bulgaria)
4. Zlin Municipality (Czech Republic)
5. Town of Kladno (Czech Republic)
6. Bic (France)
7. Communauté Urbaine de Dunkerque (France)
8. Kautex Textron GmbH (Germany)
9. Unicredit (Italy)
10. Comune di Piombino (Italy)

11. Kaunas Municipality (Lithuania)
12. Stadhuis Amsterdam (The Netherlands)
13. DSM (The Netherlands)
14. Instituto Superior de Engenharia do Porto (Portugal)
15. METROREX (Romania)
16. Parliament House (Romania)
17. PREDILNICA LITIJA d.o.o (Slovenia)
18. TAIM-TFG S.A (Spain)
19. Vattenfall Service Nord AB (Sweden)

2010

1. Dagda Town Council (Latvia)
2. ING Real Estate (The Netherlands)
3. E-on (Germany)
4. O.S.V.O Comp, a.s. (Slovakia)
5. Municipality of Dobrich (Bulgaria)
6. Prague Marriott Hotel (Czech Republic)
7. Public Service of the City of Villingen-Schwenningen (Germany)
8. Saule Birinius Pils SIA (Latvia)
9. NH Hotels (Spain)
10. Aguas do Cavado (Portugal)
11. Decathlon (Spain and Romania)
12. Center of Dialysis in Bearn Pau-Aressy (France)

2011

1. City of Tilburg (The Netherlands)
2. City of Zaprešić (Croatia)
3. Delhaize Belgium (Belgium)
4. Gemeinde St. Georgen (Germany)
5. ING Luxembourg (Luxembourg)
6. MBZ N.V. (Belgium)
7. Nestlé France (France)
8. Prokind Scholengroep, (The Netherlands)
9. Unibail-Rodamco shopping centres (Spain)

2012

1. bft Petrol station Vornmoor GmbH (Germany)
2. City of Lille (France)
3. COOP Lombardia (Italy)
4. Decathlon (Italy and Romania)
5. Migration Solutions (UK)
6. Stadt Langen (Germany)
7. Telenet Group Holding (Belgium)
8. VZW K.S.O.Z. (Belgium)

2013

1. AB Inbev (Belgium)
2. ABN AMRO (The Netherlands)
3. Banque de France (France)
4. Bayer Hispania (Spain)
5. Brussels Airlines (Belgium)
6. France Quick SAS (France)
7. Gijbels Group (Belgium)
8. Vincipark (France)
9. WinTO GmbH (Germany)

2014

1. OMS spol s.r.o. F warehouse (Slovakia)
2. EOC Belgium NV (Belgium)
3. Max Moritz GmbH & Co KG (Germany)
4. Hammer GmbH & Co KG (Germany)
5. City of Jastrebarsko (Croatia)
6. Les Nouveaux Espaces (France)

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